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(54) Title: CLEANING COMPOSITION

(57) Abstract

A post-foaming gel composition for use in an aerosol container which composition comprises a base material, said base material consisting at least of a detergent such as an anionic surfactant and a thickener which is preferably an alkanolamide, a glyceryl ester or derivative or blend thereof with betaine or a gum. The base material has a viscosity of at least 9,500 cps, preferably at least 20,000 cps or higher. A foam forming propellant gas such as pentane is mixed with the base material, the propellant being maintained in suspension in the composition until the composition is dispensed from an aerosol.

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CLEANING COMPOSITION

This invention relates to a cleaning composition and more particularly a personal cleaning composition intended for use in a shower.

Although personal cleaning compositions have been developed for showers, such as shower gels, a significantly large number of people prefer to use a conventional bar of soap rather than a shower gel. It is believed that one factor responsible for resistance to the use of shower gels is connected to lather generation. Shower gels are provided in containers or dispensers from which the user must obtain a dose. This finite amount of gel will produce a finite amount of lather. In order to produce the lather the user must apply shear to the gel, for example by rubbing the gel on a part of the body. However, the lather so produced is soon washed away by the stream of water from the shower head. Indeed, in some cases the gel can be washed away and wasted before the user has been able to apply the gel to a part of the body and create a lather. A bar of soap, on the other hand, provides a continuous supply of lather even if the stream of water from the shower head is directed onto the soap bar.

In order to deal with this problem it has been proposed to make provision for the generation of lather

from a shower gel as soon as possible after the gel is dispensed. One way of effecting this is to use an aerosol to contain the gel. On release of the contents of the aerosol a foam in the form of a mousse is formed substantially instantaneously. The problem with this proposal is that it is a widely held belief that the generation of a lather by the user of a cleaning composition is essential for satisfactory cleaning. The application of a preformed lather, even if perfectly efficacious is not thought to be so.

WO96/09032A discloses a soap free post-foaming gel composition which is particularly intended for wet shaving using a razor. The composition is preferably prepared by forming a base material consisting of water, a water soluble N-acyl sarcosinate salt and a non-volatile paraffinic hydrocarbon. To this thin, relatively low viscosity mixture is added a volatile hydrocarbon such as isopentane. This addition causes the formation of a gel structure. While this composition is satisfactory for its intended purpose of a shaving foam it does not perform well for personal washing mainly because it gives an uncomfortable "stripped" feeling to the skin. This effect is believed to be caused by the composition removing the natural skin lipids which gives a "squeaky" skin feel which users dislike.

The present invention is intended to provide a post foaming gel composition for personal cleaning which feels good to use.

According to the invention there is provided a cleaning composition for use in an aerosol container, said composition comprising (a) a base material which consists at least of a detergent and a thickener, said base material having a viscosity greater than 9,500 cps and (b) a foam forming material, at least a part of the foam forming material being maintained in suspension in the composition until after the composition is dispensed from the aerosol.

An important feature of the invention is the viscosity of the base material which is such that the base material is already in the form of a gel prior to the inclusion of the propellant. The minimum viscosity of the base material is, as stated, 9,500 cps (measured on a Brookfield viscometer [spindle 4/speed 20]). Preferably, however, the viscosity of the base material is considerably higher, for example above 20,000 cps and more preferably above 30,000 cps and particularly preferably above 60,000 cps (on the same basis of measurement). The base material in the form of a gel is stable and enables a high level of propellant to be included in the composition. The viscosity of the gel composition provides for control of the rate of foaming

when the composition is dispensed from the container. In addition the relatively high viscosity of the composition gives stability to the composition during storage prior to use.

It has been found that the foam produced by compositions of the invention have a very different structure to the prior art foams produced from post-foaming compositions. The prior art foam consists of a plurality of small closed cells with a few slightly larger cells here and there. The foam obtained with the invention comprises a plurality of large cells, that is to say up to ten times the size of the largest cells in the prior art foam, with smaller cells filling in the spaces between the larger cells. These smaller cells are in most cases bigger than the largest cells in the prior art foam. The foam of the invention has a high volume and a creamy texture and does not impart the so-called stripping feel to the skin that is experienced with prior art foams.

A preferred embodiment of the invention is intended for use in a shower. In that embodiment a level of propellant is used, for example above 9.0% by weight, which is higher than in prior art foams used for shaving. It has been found that the composition of the invention with such higher levels of propellant are easily rinsed away when used in a shower or other

circumstances such as hand washing. Prior art foam, especially foam intended for shaving, with its small cell structure is less readily rinsed away. A shower foam with such a "tight" structure is less readily rinsed away, but instead remains as a foam when washed from the skin and can clog up the waste outlet.

When the composition of the invention is used the formation of a foam or lather is delayed for a short time after the composition is dispensed by virtue of the propellant gas being retained in suspension. Very shortly after dispense agitation of the composition by the user causes the gas to permeate through the composition and a lather or foam is formed. Thus it appears that the user is responsible for creating the lather or foam as with conventional cleaning materials and the composition is seen as providing the behaviour expected for a good cleaning operation.

The thickener used in the composition of the invention must be one that will maintain the propellant gas in suspension until after the composition is dispensed from the aerosol container. Thickeners useful in the present invention include polyacrylic acids, natural and synthetic clays, alginates, collagen thickeners, cellulose thickeners, gelatin, glycerin based thickeners, guar thickeners, polyquaternium thickeners, xantham gum, acrylate copolymers,

polyethylene glycol thickeners and glycol esters. The preferred thickeners include alkanolamides such as coconut diethanolamide, glyceryl esters and derivatives and blends thereof such as glyceryl laurate together with cocamidopropyl betaine and guar gums such as hydroxypropyl trimonium chloride. The amount of thickener used depends upon the particular thickener employed. For example in the case of coconut diethanolamide from 0.05 to 20.0%, preferably from about 2 to 4% and more preferably 3.0% by weight will generally be adequate. With the glyceryl laurate/cocamidopropyl betaine blend amounts of from 0.05 to 30% preferably from 5 to 10% by weight are preferably employed.

The composition of the invention requires sufficient foam forming material so that the composition does not thin and separate. In addition the detergent should also be present in an amount which does not result in the composition thinning. Preferably the amount of detergent should be in the range 0.05 to 60.0% and preferably not less than 7% and more preferably not less than 15% by weight of the total composition.

The particular foam forming material and surfactant system used in the composition is not critical and they can be chosen according to the

particular type of composition that is being formulated.

The preferred foam forming materials are saturated aliphatic hydrocarbons having from 4 to 5 carbons such as n-butane, iso-butane, n-pentane and iso-pentane.

Detergents which can be used in this invention include anionic, cationic, nonionic, amphoteric surfactants and mixtures thereof. Detergents which are useful include alkyl polyglucosides, ethoxylated and non-ethoxylated metal alkyl sulphanates, sultanes, taurates, sarcosinates, sulphonates, ether carboxylates, glycinates, quaternary ammonium compounds, polysorbates, sugar esters, alkyl phosphates, propionates, amino acid surfactants, glysides, alkanolamides and betaines.

The particularly preferred detergents used in the invention are anionic surfactants such as alkali metal alkyl ether sulphates, sulphosuccinates and acyl glutamates. A particularly preferred surfactant is sodium lauryl ether sulphate. If desired a mixture of surfactants can be used. These may be all anionic or may be a combination of anionic with one or more of nonionic, amphoteric and cationic surfactants.

The aerosol container may be any such container that can dispense a post foaming gel.

The invention is further illustrated by the following Examples, reference being also made to the accompanying drawings in which:-

Fig.1 shows the foam of the invention magnified ten times; and

Fig.2 shows a prior art shaving foam also magnified ten times.

EXAMPLE 1

The following base material was prepared (all percentages by weight based on the weight of the final composition):-

Cocamidopropyl betaine	1.5%
Cocamidopropyl betaine & glyceryl Laurate Blend	7.0%
Aminoxide	0.9%
Sodium lauryl ether sulphate	18.0%
Hydroxypropyl Triammonium Guar	0.3%
Fragrance	0.7%
Water (value adjusted to)	71.6%

The resultant base material had a viscosity of 127, 500 cps using a Brookfield viscometer (spindle 4/speed/1). Isopentane was added in the amount of 10% and the resultant composition charged into a bag within an aerosol container.

Butane was used as the propellant gas outside the bag.

The composition was dispensed as a thick shear thinning gel. Foaming started after dispense and the foaming action was increased by agitation of the gel.

The invention is not limited to the above described specific embodiment and many variations and modifications can be made. In particular the invention is not restricted to shower gels and can be applied to other personal cleaning compositions such as hand wash and facial wash compositions and the like.

The foam of the invention was examined under a microscope at ten times magnification and the result is shown in Fig.1. As can be seen from the Fig. the foam consists of quite large cells 10 of varying shapes with smaller cells 12 filling in spaces between the larger cells. Fig.2 shows the foam produced from a prior art post foaming gel intended for shaving. That foam consists of much smaller, substantially circular cross section cells 14 with a few somewhat larger cells 16 interspersed at random intervals amongst the smaller cells.

The large cell structure of the foam produced by the composition of the invention is believed to be, at least in part, due to the amount of propellant in the

composition. Further when the composition is used in a hot shower, the effect of heat on the composition is to cause the propellant to boil off quickly so that a large amount of foam is produced.

The composition of the invention was submitted to a test panel to assess various attributes or properties thereof. The panel also assessed the same attributes of a conventional bath foam and a conventional tablet of soap. The procedure was as follows:-

A small amount of each product was dispensed onto each panellists hand except for the tablet of soap which was used directly. Each panellist "lathered" (i.e. agitated the product) for 15 seconds followed by rinsing for 15 seconds. They then dried their hands with a towel. They were asked to award a score in respect of various attributes in accordance with the following Table 1.

TABLE 1

1. Ease of Spreading

V Difficult		Difficult		Moderate		Easy		V Easy	
1	2	3	4	5	6	7	8	9	10

2. Rate Of Lather Build Up

V Slow		Slow		Moderate		Fast		V Fast	
1	2	3	4	5	6	7	8	9	10

3. Amount Of Lather

V Little		Little		Medium		Much		V Much	
1	2	3	4	5	6	7	8	9	10

4. Lather Texture

V Thin		Thin		Moderate		Creamy		V Creamy	
1	2	3	4	5	6	7	8	9	10

5. Ease of Rinsing

V Difficult		Difficult		Moderate		Easy		V Easy	
1	2	3	4	5	6	7	8	9	10

6. Feel of Wet Hands

Dislike Extremely	Dislike V Much	Dislike Moderately	Dislike Slightly	Neither like Nor Dislike	Like Slightly	Like Moderately	Like Vmuch	Like Extremely
1	2	3	4	5	6	7	8	9

Dry Hands

7. Smoothness

V Rough		Rough		Medium		Smooth		V Smooth	
1	2	3	4	5	6	7	8	9	10

8. Softness

V Harsh		Harsh		Medium		Soft		V Soft	
1	2	3	4	5	6	7	8	9	10

9. Overall Product Acceptance

Dislike Extremely	Dislike V Much	Dislike Moderately	Dislike Slightly	Neither like Nor Dislike	Like Slightly	Like Moderately	Like Vmuch	Like Extremely
1	2	3	4	5	6	7	8	9

Skin Feel After 15 mins.

10. Smoothness

V Rough		Rough		Medium		Smooth		V Smooth	
1	2	3	4	5	6	7	8	9	10

11. Softness

V Harsh		Harsh		Medium		Soft		V Soft	
1	2	3	4	5	6	7	8	9	10

12. Overall Product Acceptance

Dislike Extremely	Dislike V Much	Dislike Moderately	Dislike Slightly	Neither like Nor Dislike	Like Slightly	Like Moderately	Like Vmuch	Like Extremely
1	2	3	4	5	6	7	8	9

The results of this evaluation are shown in Table 2.

TABLE 2

Attribute	Bath Foam	Tablet Soap	Invention	Sig Level (Invention vs. Best Score)
Ease of Spreading	6.2	7.05	7.85	< 0.1%
Rate of Lather Build Up	5.2	6.15	9.1	> 0.1%
Amount of Lather	5.05	5.7	9.1	> 0.1%
Lather Texture	4.75	6.9	9.15	> 0.1%
Ease of Rinsing	6.45	6.95	7.4	> 10%
Feel of Wet Hands	5.4	5.45	6.65	> 0.1%
Smoothness	6.5	6.0	7.25	> 1.0%
Softness	6.55	5.95	7.65	> 0.1%
Overall Product Acceptance	5.1	5.7	7.65	> 0.1%
Smoothness (after 15 mins)	5.95	5.8	7.35	> 0.1%
Softness (after 15 mins)	5.8	5.6	7.3	>0.1%
Overall Product Acceptance (after 15 mins)	5.1	5.25	7.3	> 0.1%

The method of production of the composition of the invention using different materials is illustrated in the following Examples 2 to 5. The ingredients used in these Examples are listed in the following Table 3. For convenience the ingredients are referred to by the number in the table.

TABLE 3

Ingredient (CTFA Name)	Trade Name	Supplier
1). Sodium Lauryl Ether Sulphate SLES (25%)	-	Hickson-Manro
2). Cocamidopropyl Betaine	(Tego Betain L7)	TH Goldschmidt AG.
3). Aminoxide	(Aminoxide WS 35)	TH Goldschmidt AG.
4). Disodium EDTA	-	-
5). PEG 7 Glyceryl Cocoate	(Cetiol HE)	Henkel
6). Hydroxypropyl Tri-ammonium Guar	(Jaguar C162)	Rhone Poulenc
7). Fragrance	-	-
8). Coconut Diethanol amide	(Rewomid DC 212/S)	Rewo
9). Sodium Cocoyl isethionate	(Elfan AT 84G)	Akzo-Nobel
10). Sodium Cocoyl Glutamate	(Hostapon KCG)	Hoescht
11). Preservative	(Euxyl K400)	Schulke & Mayr
12). Cocoamidopropyl Betaine & Glyceryl Laurate	(Antil HS 60)	TH Goldschmidt AG.
13). PEG 4 Rapeseed Amide	(Aminol N)	Chem - Y
14). PEG 200 Glyceryl Hydrog. Palmiatate (and) PEG 7 Glyceryl Cocoate.	(Rewoderm LI80)	Rewo
15). Methyl Cellulose	(Benecel MP 943 W)	Aqualon
16). Water	-	-

The amounts of the ingredients used in the Examples is set out in the following Table 4.

TABLE 4

	Example 2	Example 3	Example 4	Example 5
1).	71.50%	54.0%	71.50%	71.50%
2).	5.00%	5.00%	5.00%	5.00%
3).	1.00%	1.00%	1.00%	1.00%
4).	0.15%	0.1%	0.15%	0.15%
5).	1.0%	-	1.0%	1.0%
6).	0.3%	0.5%	0.3%	0.3%
7).	0.7%	0.7%	0.7%	0.7%
8).	-	1.0%	-	-
9).	-	5.0%	-	-
10).	-	3.36%	-	-
11).	0.08%	0.08%	0.08%	0.08%
12).	-	8.00%	-	-
13).	5.00%	-	-	-
14).	-	-	5.00%	-
15).	-	-	-	1.0%
16).	balance	balance	balance	balance

Example 2

Water was added to (1). The betaine (2) was then added followed by (3). (4) was then dissolved in the mixture. (5)(6) and (7) were mixed together in a premix which was then added to materials (1)-(4). The preservative (11) was then added followed by (13) and the product mixed until a viscosity of 130,000 cps (Brookfield, Spindle RV 4, Speed 0.5) was built.

Example 3

(8) was dissolved in (16) and then added to (1), (2), (3) and (10) were then added along with (4) until dissolved (6),(7) and (8) were premixed and then added to the aforementioned ingredients. (11) was then added followed by (12) and the product mixed until a viscosity of above 100,000 cps (Brookfield, Spindle RV4, Speed 1) was built.

Example 4

Water was added to (1). The betaine (2) was then added followed by (3). (4) was then dissolved in the mixture. (5)(6) and (7) were mixed together in a premix which was then added to materials (1)-(4). The preservative (11) was then added followed by (14) and the product mixed until a viscosity of 60,000 cps (Brookfield, Spindle RV4, Speed 2) was built.

Example-5

Water was added to (1) followed by (15). The betaine (2) was then added followed by (3). (4) was then dissolved in the mixture. (5), (6) and (7) were mixed together in a premix which was then added to materials (1)-(4). The preservative (11) was then added. The viscosity was 26,800 cps (Brookfield, Spindle RV4, Speed 2).

The base materials prepared in the foregoing Examples 2 to 5 were mixed with isopentane (95%) in a 9:1 ratio to produce the post-foaming gel composition of the invention. The composition was then charged to an aerosol can in the same way as in Example 1.

CLAIMS

1. A cleaning composition for use in an aerosol container, said composition comprising (a) a base material which consists at least of a detergent and a thickener, said base material having a viscosity greater than 9,500 cps and (b) a foam forming material, at least a part of the foam forming material being maintained in suspension in the composition until after the composition is dispensed from the aerosol.

2. A composition as claimed in Claim 1, wherein the viscosity is greater than 20,000 and preferably greater than 60,000 cps.

3. A composition as claimed in Claim 1 or Claim 2, wherein the thickener is selected from one or more of polyacrylic acids, natural clays, synthetic clays, alginates, collagen thickeners, cellulose thickeners, gelatin, glycerin based thickeners and guar thickeners, polyquaternium thickeners, xantham gum, acrylate copolymers, polyethylene glycol thickeners and glycol esters.

4. A composition as claimed in any preceding claim, wherein the thickener is an alkanolamide, a glyceryl ester or derivative thereof or a blend thereof with betaine and/or a gum.

5. A composition as claimed in Claim 4, wherein the alkanolamide thickener is present in an amount of from 2 to 4% by weight.

6. A composition as claimed in Claim 4, wherein the glyceryl blend is present in an amount of from 5 to 10% by weight.

7. A composition as claimed in any preceding claim, wherein the detergent is present in an amount not less than 7.0% by weight of the total composition.

8. A composition as claimed in any preceding claim, wherein the detergent is selected from one or more of anionic, cationic, nonionic, amphoteric or mixtures thereof.

9. A composition as claimed in any preceding claim, wherein the detergent is selected from one or more of alkyl polyglucosides, ethoxylated metal alkyl sulphanates, non-ethoxylated metal alkyl sulphanates, sultanes, taurates, sarcosinates, sulphonates, ether carboxylates, glycinates, quaternary ammonium compounds, polysorbates, sugar esters, alkyl phosphates, propionates, amino acid surfactants, glysides, alkanolamides or betaines.

10. A composition as claimed in any preceding claim, wherein the foam forming material is a saturated aliphatic hydrocarbon preferably having from 4 to 5 carbons.

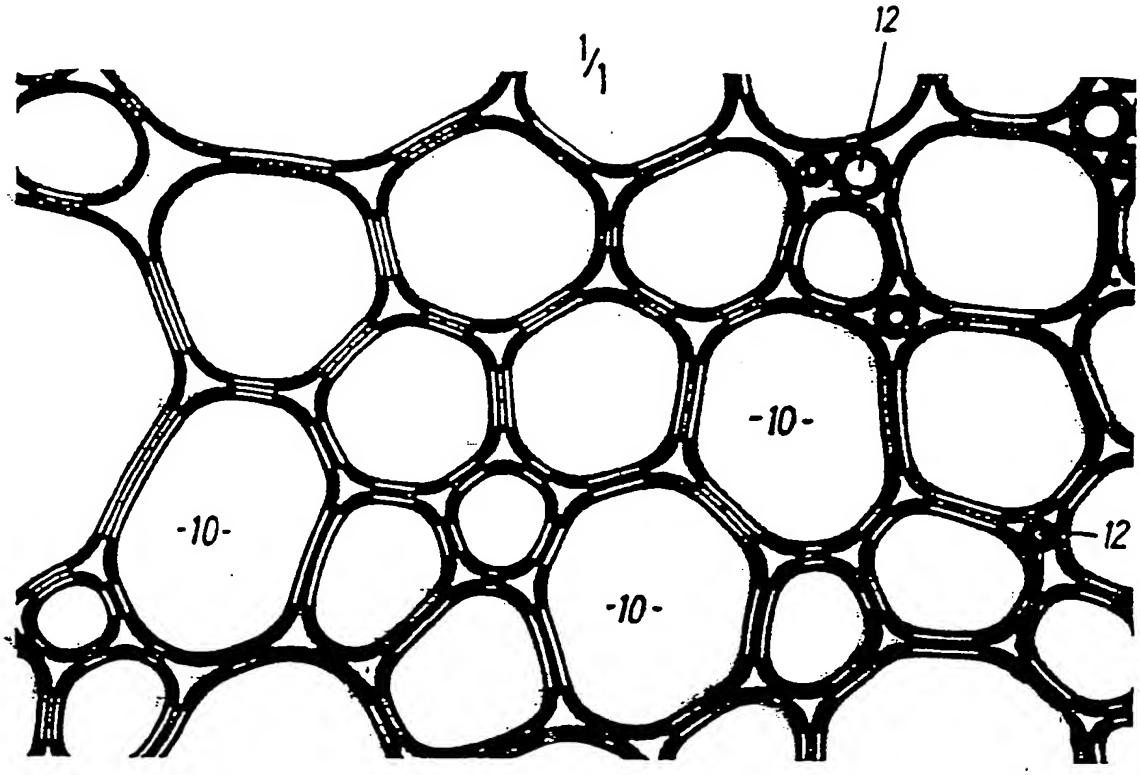

FIG. 1

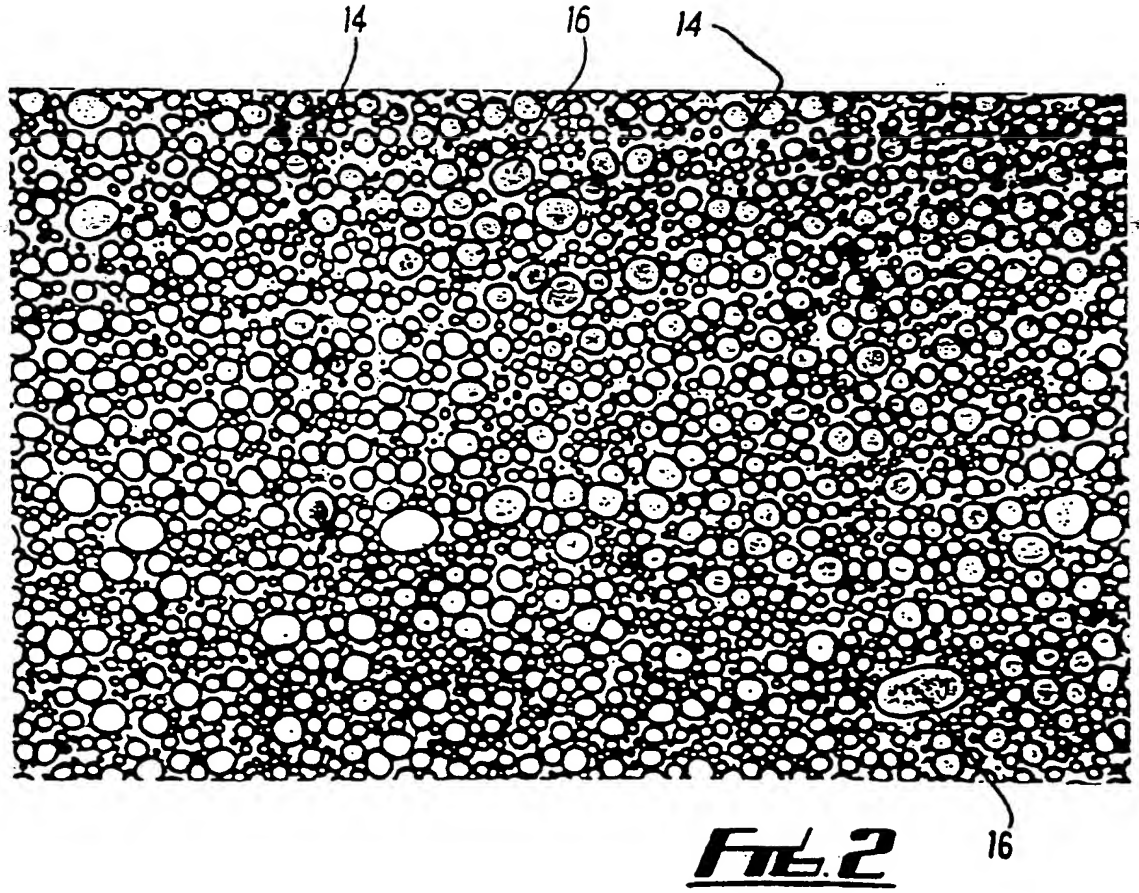

FIG. 2

INTERNATIONAL SEARCH REPORT

Inter ›nal Application No
PCT/GB 96/01744

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61K7/50 A61K7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,95 13349 (DOWBRANDS) 13 May 1995 see claims 1-5,8,10,12,13,16 see page 4, line 28 - page 8, line 16 see page 10, line 22 - page 14, line 38 ---	1,3,4, 7-10
X	WO,A,95 05796 (UNILEVER) 2 March 1995 see page 5, line 34-37; claims 1-3,5 see page 6, line 1-35 see page 7, line 9-23 ---	1,3,4, 7-10
X	WO,A,94 02109 (DOWBRANDS) 3 February 1994 see claims 1-3,14,15 see page 5, line 33 - page 6, line 10 see examples 9-12 ---	1,3,7-10
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[X] Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
9 December 1996	17.12.96

Name and mailing address of the ISA	Authorized officer
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PCT/GB 96/01744

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,43 27 699 (HENKEL) 23 February 1995 see claims 1-3 see page 2, line 30 - page 3, line 45 -----	1,3,7-10

1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Inte onal Application No
PCT/GB 96/01744

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A-9513349	18-05-95	AU-A-	1093495	29-05-95
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		CA-A-	2127074	24-02-95
		EP-A-	0724424	07-08-96
		US-A-	5496538	05-03-96
		ZA-A-	9406412	23-02-96
WO-A-9402109	03-02-94	AU-A-	4786893	14-02-94
		CN-A-	1087380	01-06-94
		EP-A-	0652739	17-05-95
		ES-A-	2075820	01-10-95
		FI-A-	950373	27-01-95
		HU-A-	70703	30-10-95
		JP-T-	7509513	19-10-95
		NO-A-	950309	27-01-95
		PL-A-	307296	15-05-95
DE-A-4327699	23-02-95	WO-A-	9505158	23-02-95